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A Land Ethic for Protecting Biodiversity

Mitch Friedman
Greater Ecosystem Alliance

Mitch Friedman is the executive director of the Greater Ecosystem Alliance, P.O. Box 2813, Bellingham WA 98227, (206) 671-9950. He has worked extensively in landscape ecology and landscape level ecological planning.

> "A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise." - Aldo Leopold

A land ethic is a concept of empowerment and optimism. With a solid land ethic, environmental protection can be achieved by self-motivated individuals, rather than enforced by society. A land ethic was first proposed by Aldo Leopold, perhaps the earliest resource professional to present a broad notion of conservation. As a Leopold loyalist, I expand upon the ideas he crafted five decades ago.

I argue for two components of a land ethic which can be incorporated into any resource profession. First is a standard of ecological function. The objective of the ethic should be to sustain the processes associated with native biodiversity, rather than to "improve nature" by directing or even preserving selected elements or services of nature.

Second is action - the wheel of the land ethic must hit the road. Resource professionals should be inspired devotees of biodiversity, able to educate and integrate the public in its conservation. These people have an essential role in representing the land whenever another manager or landowner (including the person's employer), betrays the land ethic.

The results of a land ethic are best measured on the ground, not in the human psyche.

Leopold'S Land Ethic

In A Sand County Almanac, Aldo Leopold wrote that a land ethic "reflects the existence of an ecological conscience (which) reflects a conviction of individual responsibility for the health of the land." By itself, that statement could justify a variety of actions. "Health" is subject to definition.

Indeed, Leopold describes a "cleavage" in the viewpoints of conservationists based on their expectations of what a healthy environment means. While one general group tends to define health in terms of commodity production (such as fibre growth on a tree farm), another group "worries about a whole series" of values which imply an ecological conscience. It is this disparity in philosophy (regarding what the land is for) that allows extraction industries and "wise use" (or "share") groups to proclaim themselves environmentalists.

To Aldo Leopold, nature was a "round river" continually cycling energy and nutrients and, in effect, flowing into itself. He saw the land in terms of functions, and defined

"health" in ecological terms: the land's capacity for self-renewal. This is a profound development in North American thought, as it parts company with earlier notions of both conservation and preservation. These two concepts, and their vast differences, can be traced to Gifford Pinchot and John Muir.

Canadians and Americans alike recognize Gifford Pinchot as the father of modern forestry and forest conservation. At the time of his greatest influence, Pinchot was a resourcist: he divided the world into two categories, people and resources, and declared that "the first great fact about conservation is that it stands for development." As Canadian naturalist John Livingston (1981) points out, Pinchot's "wise use" notion objectified all of nature, including wildlife, as human commodities. To Pinchot, a healthy land was one of sustained economic productivity, not necessarily ecological function.

Pinchot's ideas remain alive in North American society and underlie the management philosophies of timber corporations and government agencies. While resourcism has been carried to an extreme by the wise use movement, it is also evidenced in the most basic perceptions of our society.

Canadian writer Bruce Littlejohn asks, "Have Canadians lost sight of the ultimate power of nature? Can we now see it only as a playground or recreational resource to be enjoyed occasionally, or in strict utilitarian terms - as a storehouse of natural resources that exists solely for our material benefit?"

So often and confidently have forest and wildlife managers pronounced their ability to direct environmental outputs in accordance with public or market demands that the public may truly believe them. Ancient forests can be replanted. Salmon can be hatched in tanks. Soils can be fertilized. Forest fires can be doused. All without impact. This view accepts discarding millions of years of evolutionary adaptation, so long as it is done in accordance with the latest computer models and the oversight of professionals.

Unfortunately, an ethic of technocratic optimism has delivered us a biodiversity crisis. Biodiversity can be defined in terms of interrelated composition, structure and function (Franklin 1981). This means that as we lose populations, species, and communities, we also lose the functions they perform.

For instance, researchers have only recently discovered that over 8,000 invertebrate species reside in the soils of Oregon's ancient forests (Asquith, Lattin and Moldenke 1990). These organisms cycle nutrients, mold the consistency of the soil and pump life into trees and squirrels. They are part of the capital of forest productivity that is squandered when ancient forests are clearcut and the residue burned. Even with Pinchot's direct oversight, a team of robots using advanced computer guidance could not replace the composition (flightless beetles) and structure (the web of hyphae on a tree root) of soil after it is abused. Without these components and structures, we lose known and unknown functions related to forest productivity, such as the effect of actinomycete secretions on soil grain size.

A recent study of 90-year-old naturally-regenerated Appalachian forests found that some native plants may require centuries (or perhaps eternity) to return to a clearcut site (Duffy and Meier 1992). Yet foresters routinely claim they can make clearcuts regenerate to any future condition desired by society. Hammish Kimmins, a prominent University of British Columbia forestry professor, boasts the ability to "preserve ecosystem functions and ecosystem values within the contexts of use and management" (Simpson 1993).

At the time that Pinchot was developing the conservation resourcism described above, John Muir was advocating preservation. Muir was an aesthete and recognized the inherent value and mystery in life and wilderness. Muir wanted places preserved for these values. His vision spawned the other pole of American environmental thought, reflected

in the traditional wilderness movement.

Muir's ideas also are alive and well today. They inspire many calls for the appreciation and protection of nature for nature's own right. Yet preservationism also is carried to an extreme in some instances. In British Columbia, campaigns are being waged for "representative protection" of pristine areas, often without consideration of maintaining biodiversity and ecological processes (Frost and Friedman 1993). At appropriately large scales, wilderness is the best means for maintaining biodiversity (Noss 1991). But efforts to capture ecological snapshots in small or isolated wilderness reserves are ill-fated. The quest to preserve "a marvel of each color" is exhibited in B.C.'s Endangered Wilderness campaign, which calls for roughly 12 percent of the province to be protected as representative vignettes, but the future health of these areas is not well considered in the strategy. A draft circular of the West Arm Wilderness Group extols how the West Arm Area of the Kootenays contains "adequate examples of landscape number 24," as though somewhere a museum display awaits empty for such a find.

Even more intriguing are recently proposed standards for riparian protection announced by the B.C. Forest Service's Cranbrook District (Nelson Forest Region). In an odd mix of resourcism and preservationism, these guidelines would allow logging to a stream bank for 200 streamside meters if staggered alternately with 200 meters where riparian vegetation was left undisturbed.

The extreme preservation view is fixated with the compositional aspect of biodiversity. It would preserve components - whether species or forest types - with scant recognition of the ecological functions of these components. Fragments of riparian vegetation will not buffer a stream from eroding soils or provide the constant shade for maintaining cool waters needed by many fish. A small isolated stand of coastal Douglas- fir may not provide sufficient habitat for a pileated woodpecker or a pine marten (not to mention viable populations). It will likely become a ghost museum when climate changes shift northward the environmental conditions suitable for the stand.

Leopold avoided this thinking. Recall, his land ethic measured health in terms of ecological self-renewal. Ecologist James Karr (1986) offers further elucidation on ecological health:

> A biological system... can be considered healthy when its inherent potential is realized, its condition is (relatively) stable, its capacity for self-repair when perturbed is preserved, and minimal external support for management is needed.

This is a functional objective of the land ethic. It is met by protecting vast areas, large enough to maintain viable populations of all native species and allow them the flexibility to adapt to environmental changes. The young discipline of conservation biology (see e.g., Soule 1985) seeks the means to protect biodiversity. This is complicated by the dynamic nature of nature (see e.g., Pickett, Parker and Fiedler 1992; Hunter, Jacobson and Webb 1988). We need to recognize that we are members of a complex community about which we understand little. As Leopold cautioned, we cannot assume "that the economic parts of the biotic clock will function without the uneconomic parts."

This type of land ethic, focused on ecological function, is fundamentally different from either Pinchot's resourcism or Muir's preservationism. While it does not exclude human needs (including a level of resource output and the benefits of a relatively stable environment) it does not support the large- scale alteration of natural systems for commodity production. Ecosystems are not necessarily able to sustainably provide an overgrowing supply of commodities for pragmatic human demands.

On the Ground

Implementing a function-based land ethic will be difficult. We live in a society of political decision-making where social values subsume other concerns. While Pinchot's resourcism called for restrictions on the behaviour of corporations, it was framed solely in the interests of people. Pinchot's goal was to provide "the greatest good for the greatest number of people." Sustaining the land's health must come before social values, or we eventually lose. "Biodiversity is not just another multiple-use goal - it is a condition fundamental to viable ecosystems," conservation biologist Ed Grumbine writes in Ghost Bears (1992).

Ideally, this point would be understood by all legislative committees, forest planning teams, and citizen consensus groups. However, it is probably ambitious enough to expect a land ethic to be practiced by resource professionals. Some believe positive changes are occurring in forest management (Salwasser 1991). The U.S. Forest Service is pursuing "partnerships" and citizen participation through its New Perspectives program. In B.C., there have been community plans drafted in Hazelton, a sustainable development committee in Clayoquot Sound, the roving CORE (provincial Council on Resources and the Environment) process, and increasing calls for local consensus efforts. I am skeptical that any of these can resolve problems caused by conflicting paradigms, which manifest in society's lack of a shared land ethic. The problem is too deep.

While education could help toward this vision of a shared land ethic implemented at the community level, education alone is not enough. Leopold lost his optimism for conservation through education when it failed to protect farm soils in Wisconsin in the 1930s and 40s. "The net result is that we have more education but less soil, fewer healthy woods, and as many floods as in 1937." While education may help us to better understand one another, we will require a shared land ethic to help us agree on how best to live within our environment.

Developing this ethos will be no mean task. Leopold observed, "An ethic, ecologically, is a limitation on freedom of action in the struggle for existence."

Grumbine also calls for the recognition of limits. "Watershed- based, decentralized ecosystem management for native diversity is not about how to sustain resourcism in its old or new forms; it is about providing a different kind of counsel that, over time, with plenty of hard work and lots of luck, may foster a sense of the basic limitations of being human in a finite world."

It may take centuries for society to adopt an ethic that recognizes limits on human activities and that sees humans as a part of the system - rather than the reason for the system's existence. There remains a long stretch of road between here and there, and we stand to lose much of our planet along the journey. Whose role is it to point out the limits - to protect biodiversity and ecosystems - during the interim? Certainly no group stands in a better position than professional land managers.

We are accustomed to viewing managers in the role of serving governments and corporations. Is it reasonable to expect them to change toward serving the land, even when in conflict with their employers? Yes, and Pinchot himself proved it can be done. He was very effective in fostering a professional esprit de corps among foresters (based on resourcism, though it was) that rapidly shifted timber norms from cut-and-run to replanting and sustained yield.

We must expect such a shift in role. Leopold wrote that "unless there be wilderness-minded men scattered through all the conservation bureaus, the (environmental) societies may never learn of new invasions until the time for action has passed." Every system

requires internal checks and balances; this is the role whistle-blowers perform in a bureaucracy or corporation, and dissenters in a society.

Canadians seem less inclined toward dissent than are Americans (Lipset 1990). No English tea was ever thrown into a Canadian harbor. But Canada will need dissenters, within the agencies as well as among the public, especially as corporate influence over land and government expands with global trade. At present, B.C. offers no legal protection to whistle-blowers, who may be harassed or lose their jobs if they speak out (Sandborn 1990). Efforts to reform the U.S. Forest Service would founder without dissenters like Jeff Debonis, who established the Association of Forest Service Employees for Environmental Ethics.

Herb Hammond, a registered professional forester in B.C., has several times in his career opposed the poor forest practices of clients. Yet, in each instance, the Association of British Columbian Professional Foresters has failed to support him. Four times the association has sided with industry and cited Hammond for making waves. This societal behaviour discourages dissent and places allegiance to the client before allegiance to the land.

Most forestry clients in B.C. are corporations. Professional managers are the public's only line of defense against the sacrifice of other values which may limit profits within corporations and agencies. But if these managers are more beholden to their employers than to biodiversity (or the public good), or if they remain silent by fear or principle, calamity is inevitable.

University land and wildlife management departments will be essential in fostering in future managers both a function-based land ethic and the will to act upon this ethic. Environmental journalist and professor Michael Frome says, "Educators must compel action and ethic." But many of these departments are doing the opposite now. They are captive to corporate funding and Pinchotian ethics (see, e.g., Lien 1991). They teach not only resourcism in regards to land, but conformity and compliance in regards to profession. Resource professionals betray the environment and people when they agree to alter biotic processes for short-term economic objectives.

The first loyalties of a manager must be to the land. John Livingston (1981) suggested that while such views make us appear misanthropic, "what we care about is life - all life in all forms - or, perhaps better expressed, living."

Conclusion

Humanity is part of a larger whole, and "no single part can control the system within which it is embedded" (Grumbine 1992). We need a land ethic that will continually remind us of this simple fact, and keep our objectives based on ecological functions, not on insatiable economic demands.

A land ethic based on ecological function is a plunge into cold water for the anthropocentric mindsets of our society. But the biological world does not function within our social or philosophical spheres, we function within it. Anthropologist Roy Rappaport wrote, "the issue is ultimately not a matter of morality or even Realpolitik. It is one of biological viability."

Even with this functional component, the land ethic is incomplete without an action component. Until we have a dedicated corps of multi-disciplinary resource professionals, guided by a true land ethic as Leopold envisioned, and ready and willing to act on the land's behalf, we will continue to loose biodiversity at devastating rates.

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